

Impts. in Studs and Ribs or Bars for the Soles and Heels of Boots and Shoes, &c.

In making the leather or other ribs or bars sometimes attached to the soles and heels of boots and shoes I give to the said ribs or bars preferably a triangular or flat figure in cross section and provide them with a flanged base. I make a metallic frame provided with spikes on its inner side, or with holes for nails or screws to pass through, the said frame being of a size and shape suitable to fit the flange of the ribs or bars so that when the said frame is fixed by means of its spikes or nails or screws it securely holds the rib or bar in place on the sole or heel. The said ribs or bars may cross the sole or heel from side to side or be otherwise arranged. 5

Studs and ribs or bars made according to my invention may be readily and securely fixed by any unskilled person and when desired may be removed without injury to the boot or shoe. 10

Dated this Third day of April 1895.

W. T. WHITEMAN,
Agent for the Applicant. 15

COMPLETE SPECIFICATION.

Improvements in Studs and Ribs or Bars for the Soles and Heels of Boots and Shoes, and in Securing the said Studs and Ribs or Bars to Boots and Shoes.

I, JOHN HENRY WOODFIN, of Barley Mow Inn, Trench Lock near Wellington in the County of Salop, Publican, do hereby declare the nature of my invention and in what manner the same is to be performed to be particularly described and ascertained in and by the following statement:— 20

My invention relates to studs and ribs or bars fixed to the soles and heels of boots and shoes for the purpose of improving the foothold of the persons wearing the said boots and shoes; and consists of the improvements hereinafter described in the said boot and shoe studs and ribs or bars and in the means of securing the same to boots and shoes. The improved studs and ribs or bars constituting my invention are principally applicable to the soles and heels of football boots and to boots and shoes worn in the playing of outdoor games generally, but they may also be applied to ordinary boots and shoes for use in slippery weather and for other like purposes. 25 30

My improved studs have preferably a conoidal or hemispherical shape and an enlarged or flanged base; the said studs are preferably made of vulcanised india rubber, gutta percha, leather or other elastic or hard substance such for example as hard wood, vegetable ivory or the like. The said conoidal or hemispherical studs are attached to the soles and heels of boots and shoes by means of a metallic ring fitting on the flange at the base of the stud. The said ring has two, three, four or other number of spikes, preferably made in one piece with the ring by casting, by means of which spikes the said rings and studs are fixed to the boot or shoe, the spikes passing through holes in the flange of the stud. Where the stud is made of india rubber leather or the like the flange may be without holes the spikes of the fixing ring piercing the flange on the driving home of the fixing ring. The spikes of the fixing ring may be plain or jagged. 35 40

Figure 1 of the accompanying drawings represents in side elevation and plan of underside, a stud made according to my invention and 45

Figure 2 represents in side elevation and plan the metallic fixing ring to be used with the said stud Figure 1;

Figure 3 represents in vertical section the stud and fixing ring combined and exhibits the position of the stud and fixing ring when in use. 50

Figures 3^a to 81 both inclusive represent modifications of the said studs and fixing rings hereinafter particularly described.

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The same letters of reference indicate the same parts in the several figures of the drawings.

- 3 *a* is the stud and *a'* the flange of the same. *b* is the metallic fixing ring, preferably of cast iron, having spikes *b'*, *b''* in one piece therewith. When the stud *a*, *a'* is made of leather, india rubber or other soft material the spikes *b'* of the ring *b* pierce the flange *a'* of the stud in fixing it to the sole or heel of the boot or shoe; but when the stud *a*, *a'* is made of hard wood, vegetable ivory or other hard material I provide notches *c*, *c* (or holes) in the flange of the stud through which the spikes *b'* pass.

- 40 When I make the studs of leather I take a circular disc and by dies and pressure I form it into a flanged cup the hollow part of which cup is preferably filled with a plug of india rubber or other elastic material or with a small hollow plug or bag inflated with air. When a solid plug is used in the hollow stud it is preferably cemented or otherwise fixed in the said stud.

- 15 In Figure 3 I have represented a cupped leather stud *a* made from a leather disc in the manner last described the said cup being provided with a central filling piece or plug *d* of india rubber or the like, or with a hollow inflated plug or bag as indicated in dotted lines.

- 20 Or the outer part *a* of the stud Figure 3 may be moulded in india rubber in which case the central filling *d*, when made solid, preferably consists of a material harder than elastic india rubber such for example as leather.

Or the said stud may be made with a hollow air filled chamber as represented in Figure 3^A.

- 25 Or I take a rectangular piece of leather and double it at its middle the edges of the leather being turned outwards so as to form the flange for the fixing ring to bear upon: Figure 4 represents in side elevation and vertical section a stud of the last described kind.

- Or I make the leather studs by taking several narrow strips of leather and cementing them one upon the other. I arrange the compound strip with the edges of the several strips in a horizontal plane and cut therefrom cylindrical or rectangular studs flanged at one end. The edges of the several strips of leather at the unflanged end of the studs constitute the wearing surfaces of the same. Figure 5 represents in vertical section and in plan of underside a cylindrical stud and fixing ring the said stud being made from a compound leather strip. Where 35 thought necessary or desirable the several vertical strips forming the stud *a* may be further secured by crossing rivets *e* as represented in the said Figure 5.

- Or the parts of the stud may be bound together in Figure 5^A where two shrink rings *i*, *i* are shown; and instead of employing a metallic fixing ring as before 40 described a leather or non-metallic fixing ring *b* (Figure 5^A) may be used, cross rivets or screws being passed through the sides of the fixing ring into the body of the stud for the purpose of securing the two together. The studs (Figure 5^A) are fixed to the soles and heels of boots and shoes by driving nails, spikes or screws through the non-metallic fixing rings into the leather of the boots and 45 shoes.

Figure 6 represents in plan, a pyramidal stud *a* with a circular notched flange *a'* and Figure 7 represents the same in side elevation together with its spiked fixing ring *b*; *b'* the latter being in section.

- 30 The stud *a* (Figures 6 and 7) is preferably made of hard wood, vegetable ivory or other hard substance, such for example as hard vulcanised india rubber, but where a slight yielding in the stud is desired the base or flange part only is made of hard vulcanised india rubber the lower wearing part of the stud consisting of elastic vulcanised india rubber.

- When the studs constituting my invention are made of vulcanised india rubber I 55 prefer to make the bottom or wearing part *a* of the stud of a larger diameter than the hole in the fixing ring as illustrated in the various patterns of studs represented in Figures 8, 9, 10 and 11 the said larger wearing part being forced through the

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and ring from its inner side the inner or flange part of the stud on which the fixing ring bears being preferably of hard vulcanised india rubber.

The studs made according to my invention may be without flanges and in place thereof depressions or notches a^2 (see Figures 12, 14, 15 and 17) are formed in the marginal part of the body a of the stud in which depressions or notches, teats or internal projections b^2 (see Figures 13, 14, 16 and 17) on the ring b take or engage as seen in Figures 14 and 17.

In some cases I make the flange of the stud of a greater breadth than the fixing ring and provide the said flange with an annular trough for the metallic fixing ring to fit in the said ring when the stud is fixed to the sole or heel of the boot or shoe being flush or nearly flush with the edge of the flange of the stud.

Figure 18 represents in vertical section a nearly hemi-spherical stud a with an enlarged flange a^1 in which is an annular trough for the metallic spiked ring b to seat itself in.

Figure 19 represents in side elevation and plan of underside and Figure 20 in 15 cross section a cupped stud of the last described kind rectangular in plan.

Figure 21 represents in longitudinal section and plan of underside and Figure 22 in end elevation a doubled leather stud with a troughed seat for the fixing ring or frame b to take into.

Figure 23 represents in plan of underside a doubled leather stud without end seats 20 for the fixing frame. Fixing bars b^1 , b^1 are represented in the said Figure 23 in place of a fixing ring or frame.

Or the trough seat for the fixing ring b may be formed in the face of the stud as represented in Figure 18^A.

Studs of the kind represented in Figure 23 may be provided with a cross notch 25 as represented in section in Figure 24 and plan of underside in Figure 25. With the said studs Figures 24 and 25 short or staple like frames f instead of fixing rings are employed in securing the studs to the soles and heels of boots and shoes.

A cylindrical stud with a fixing staple f is represented in vertical section and 30 plan of underside in Figure 26.

Or the fixing rings b may be permanently attached to the soles and heels of the boots or shoes and the studs be made removable therefrom the flanges of the said studs when required for use being inserted in the permanently fixed rings by pressure.

A stud in connection with a permanently attached spiked frame is represented in 35 section in Figure 27.

The india rubber or other stud may be of such a diameter at its base as to conceal the ring by which it is held, or the ring may be otherwise covered by an india rubber or leather strip.

Figure 28 represents in section a stud of such a diameter that when fixed it 40 conceals or covers the permanently attached spiked ring b .

Or the permanently attached fixing ring may have an internal screw thread and the base of the stud a screwed stem instead of a flange as represented in Figure 29 the screwed stem (marked a^1) taking into the internal screw for fixing 45 the stud.

Or the stem a^1 (see Figure 30) may have cut away parts a^1 , a^1 leading to under-cut and inclined recesses a^1 . In this case the fixing ring is provided with two internal projections or teats b^2 , b^2 at opposite points. The stud is fixed by 50 engaging the projections b^2 , b^2 of the ring with the cut away parts a^1 , a^1 of the stem a^1 of the stud and by turning the stud through about a quadrant the projections b^2 , b^2 pass under the inclined undercuts or grooves a^1 , a^1 and firmly bind therein, thereby securely attaching the stud a to its fixing ring b . The projections may however be made on the stem of the stud to engage in internal grooves in the 55 fixing rings.

Instead of employing spiked metallic fixing rings, spikeless fixing rings, that is, fixing rings provided with holes, as illustrated in Figure 31, for loose spikes, rivets

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or screws to pass through may be used to secure the studs to the boots or shoes. Although I have principally referred to and prefer to use metallic fixing rings for the studs yet I wish it to be understood that I do not limit myself thereto as leather or other non metallic fixing rings may be employed.

5 In making the leather or other ribs or bars sometimes attached to the soles and heels of boots and shoes I give to the said ribs or bars preferably a triangular or flat figure in cross section and provide them with a flanged base. I make a metallic frame provided with spikes on its inner side or with holes for nails or screws to pass through the said frame being of a size and shape suitable to fit the
10 flange of the ribs or bars so that when the said frame is fixed by means of its spikes or nails or screws it securely holds the rib or bar in place on the sole or heel. The said ribs or bars may cross the sole or heel from side to side or be otherwise arranged.

Figure 32 represents in side elevation and Figure 33 in cross section a rib or bar
15 in conjunction with its fixing frame for the soles and heels of boots and shoes the said rib or bar and its fixing frame being constructed according to my invention. The wearing part of the said rib or bar is triangular in cross section. The bar is marked *a*, its flange *a'* the fixing frame *b* and the spikes of the latter *b'*.

Figure 34 represents in side elevation and plan of underside a rib or bar having
20 a flat wearing face but provided with notches *g, g*. The fixing frame *b* in Figure 34 is without spikes and in place thereof loose rivets or screws are passed through holes *b'*, *b'* in the said frame for attaching it to the sole or heel of the boot or shoe.

Figure 35 represents in side elevation and cross section a trough or U shaped
25 rib *a* the trough of which is filled, when the rib is made of india rubber, with a hard but preferably flexible material such as leather and when the rib is made of leather with india rubber. Figure 35^A represents in cross section a rib or bar of the kind represented in Figure 35 with a chamber of compressed air in the trough of the rib or bar and Figure 35^B represents a similar cross section excepting that
30 the trough is closed at its back and ends so as to constitute an air chamber.

Instead of flanging the edge of the ribs or bars and providing them with frames, the ribs or bars may have depressions along their middle in which a spiked
metallic fixing strip seats itself when the bars are attached to the sole or heel of the boot or shoe. This modification is represented in longitudinal section in
35 Figure 36 and plan of underside in Figure 37.

Or a waved rib or bar of the kind represented in side elevation in Figure 38, plan of underside in Figure 39 and end elevation in Figure 40 may be employed,
in which case a series of cross staple like frames *f, f, f* crossing the depressions
40 between the waves are preferably used to fix the ribs or bars to the soles and heels of the boots or shoes instead of a continuous spiked frame.

Any of the studs, ribs or bars hereinbefore described may be made hollow so as to be inflated or enclose inflated air balls or chambers.

Studs and ribs or bars made according to my invention may be readily and
45 securely fixed by any unskilled person and when desired may be removed without injury to the boot or shoe.

Having now particularly described and ascertained the nature of my invention and in what manner the same is to be performed I declare that I claim as my invention;—

First. The improved studs for the soles and heels of boots and shoes and the
50 fixing rings or frames of the same hereinbefore described and illustrated in Figures 1, 2, 3, 4, 5, 5^A, 6, 7, 8, 9, 10, 11, 18, 18^A, 19, 20, 23 and 31 of the accompanying drawings; that is to say, studs having flanges at their base on which flanges or in troughs in which flanges or in troughs in the studs themselves the
55 spiked or spikeless fixing rings or frames seat themselves substantially as described and illustrated; also the modifications hereinbefore described and illustrated in Figures 12, 13, 14, 15 16 and 17 in which, in place of flanges around the studs,

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indentations or depressions are made in the marginal part of the said studs in which indentations or depressions seats or internal projections in the fixing rings seat themselves substantially as described and illustrated; also the modifications hereinbefore described and illustrated in Figures 21 and 22, in which cross grooves in the studs are used in addition to the flanges around the base of the studs in which cross grooves, crossing bars on the fixing rings or frames or staple like fixing frames bear substantially as described and illustrated.

Secondly. The improved studs for the soles and heels of boots and shoes and the fixing rings or frames for the same hereinbefore described and illustrated in Figures 27 and 28 of the accompanying drawings, the said studs being made wholly or mainly of india rubber the flanges of the same being forced into the permanently attached fixing rings by pressure substantially as described and illustrated.

Thirdly. The improved stud for the soles and heels of boots and shoes and the fixing ring for the same hereinbefore described and illustrated in Figure 29 of the accompanying drawings, the said stud having a screwed stem or a stem with projections thereon for taking into an internal screw thread in the permanently attached fixing ring substantially as hereinbefore described and illustrated; also the modification illustrated in Figure 30 in which inclined or screw like grooves are made in the stem of the stud with which internal projections in the permanently attached fixing rings engage substantially as described and illustrated.

Fourthly. The improved ribs or bars for the soles and heels of boots and shoes and the fixing frames for the same hereinbefore described and illustrated in Figures 32, 33, 34, and 35, of the accompanying drawings the said ribs or bars being provided with flanges around their base on which spiked or spikeless fixing frames seat themselves in attaching the said ribs or bars substantially as described and illustrated.

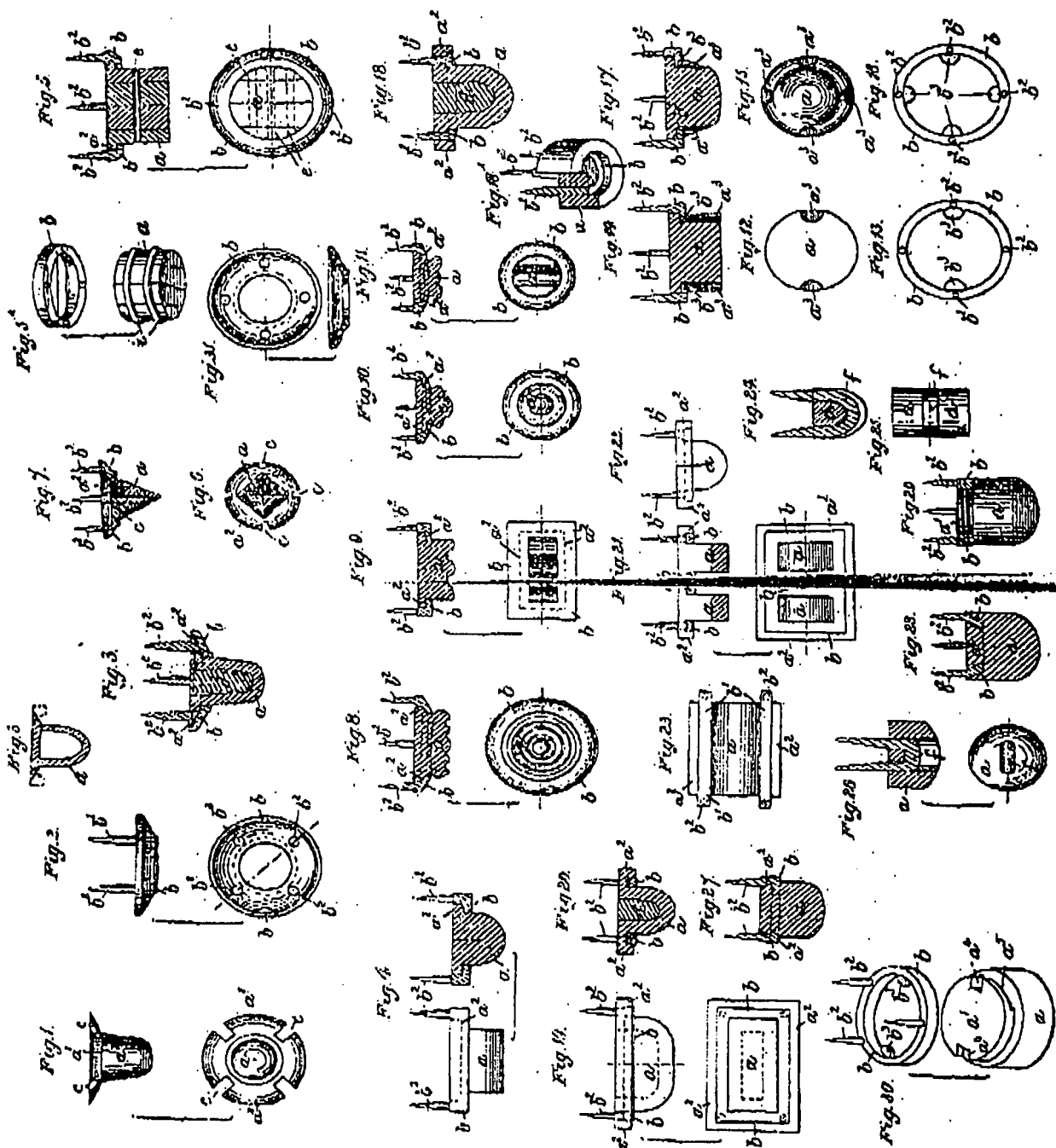
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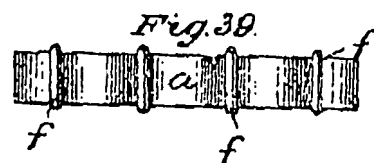
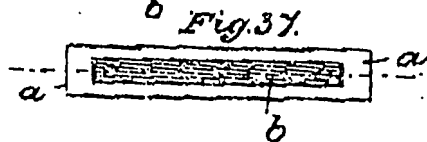
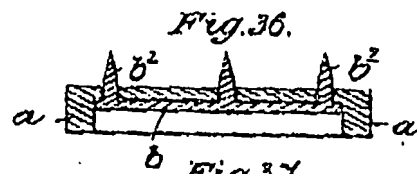
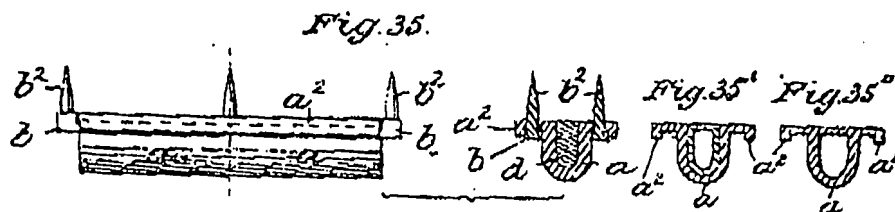
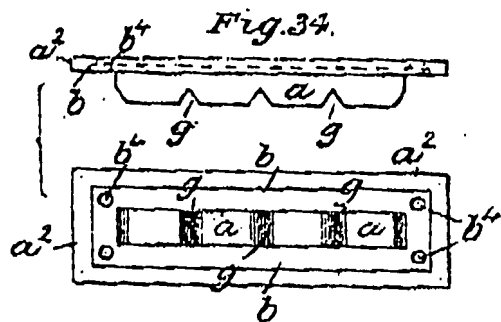
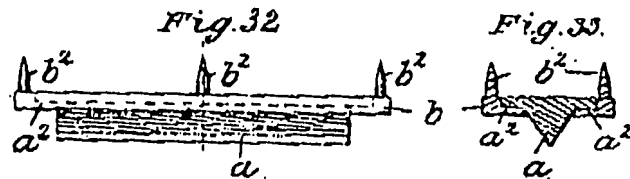
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